

ABSTRACT

A fractal structure is formed to have a plurality of regions different in fractal dimension characterizing the self-similarity. Especially in a stellar fractal structure, a region with a low fractal dimension is formed around a core with a high fractal dimension. By adjusting the ratios in volume of these regions relative to the entire fractal structure, the nature of phase transition occurring in the fractal structure, such as a magnetization curve of Mott transition or ferromagnetic phase transition, quantum chaos in the electron state, or the like. For enhancing the controllability, the fractal dimension of the core is preferably larger than 2.7 and the fractal dimension of the region around the core is preferably smaller than 2.3.